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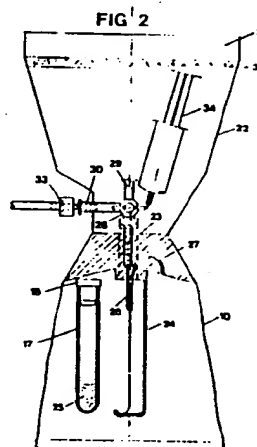
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54 **Transfer device.**

57 A device for transferring a substance from a vessel (17) by means of a transfer member provided with an axial passage, e.g. a tube (14) or a cannula (26), one end of which is connected or connectable to an opening of the vessel. The device comprises that it comprises two sealable plastic bags (10,22), one of which (10) is intended to enclose the vessel (17) and said one end of the transfer member (14,26,23) and the second bag (20,22) is intended to enclose the opposite end of the transfer member (14,26,23) and thereby providing a closed system for transferring the substance from the vessel (17) to the transfer member (14,26,23).



**Description****TRANSFER DEVICE**

The present invention refers to a device for transferring a substance from a vessel by means of a transfer member provided with an axial passage, for example a tube or a cannula, one end which is connected or connectable to an opening of the vessel.

**BACKGROUND OF THE INVENTION**

The demands for safety at the handling of blood samples have been strongly increased in later years due to the AIDS-infection. It is highly important that suspected infected blood samples can be handled in a safe way without contamination risk from the blood sampling procedure to the analysis in the laboratory. When performing different analyses the blood sample shall be transferred from the test tube to an analysis vessel, which means that the rubber stopper of the tube has to be removed before the transfer of the blood sample can take place. This of course involves a great contamination risk.

Also in other situations, for example when transferring certain toxic substances from a storing vessel to an injection syringe and further to the intended use like injection to a patient, it is desired that the nursing staff involved is protected from contamination. Such substances can be cytotoxic drugs, isotope solutions and allergy inducing substances of different kinds.

**THE PURPOSE AND MOST IMPORTANT FEATURES OF THE INVENTION**

The object of the present invention is to provide a device of the kind mentioned above, by which a substance can be transferred from a vessel without contamination risk and which device is simple and cheap to manufacture. This has according to the invention been solved by the fact that it comprises two sealable plastic bags one of which is intended to enclose the vessel and said one end of the transfer member, and the second bag is intended to enclose the opposite end of the transfer member and thereby providing a close system for transferring the substance from the vessel to the transfer device.

**DESCRIPTION OF THE DRAWINGS**

The invention will now be closer described with reference to some embodiments shown in the accompanying drawings.

Fig. 1 is side view of the first embodiment of the device according to the invention.

Fig. 2 and 3 shows in different positions of use a side view of a second embodiment of the device according to the invention.

**DESCRIPTION OF THE EMBODIMENTS**

In figure 1 the numeral 10 denotes a bag of a transparent diffusion tight material, which is open at the bottom and is provided with a foldable flap 11, which can be adhered against an adhesive portion 12, and by that tightly seal the bag 10. The bag 10 is at its opposite end provided with a neck 13, through

which a tube 14 extends. The tube 14 is sealingly fixed in the neck 13 and is at its end located in the bag 10 provided with a piston 15, which is provided with an axial through-channel 16 communicating with the tube 14.

The piston 15 fits in a cylindric test tube 17, which can be inserted into the bag 10, after which the bag is sealed by folding the flap 11 up against the adhesive portion 12. After sealing the bag 10 the test tube 17 can be manipulated from the outside of the bag without contamination risk. Thus the rubber stopper 18 of the test tube 17 can be removed and the test tube can be brought up against and passed over the piston 15 at which the substance in the test tube 17, for example a blood sample, will rise upwards in the tube 14. The bag can possibly be designed as a glove with two fingers, at which the tube 17 can be inserted in one of the fingers where the rubber stopper 18 is removed, after with the tube 17 is moved over to the other finger, in which the piston 15 is arranged.

When determining the blood sedimentation rate the tube 14 consists of a so called pipette tube intended to be secured in a stand made for this purpose. The pipette tube 14 can at its upper end be provided with a blood filter 19, which prevents blood but admits air to pass therethrough. In order to further increase the security and provide a completely closed system the upper end of the pipette tube 14 is enclosed in a plastic bag 20.

For other applications a valve 21 can be connected to the tube 14, at which the content in the test tube can be transferred to another vessel, for example an analysis vessel.

In figure 2 and 3 there is shown another embodiment of the invention intended for dissolving a dry substance contained in a vessel with a solvent and transferring the dissolved substance to an injection syringe and further to the intended use. Many medicaments has to be stored in dried condition and be dissolved by a solvent immediately before the use, since their endurance in dissolved condition is very short. Examples of such substances are cytotoxic drugs, substances containing isotopes and allergy inducing substances of different kinds. These substances must be handled so that the nursing staff will not be contaminated thereby either through direct contact or inhalation of vapours.

The device according to fig. 2 and 3 consist of two interconnected bags 10 and 22, the interior of which communicate through a connection piece 23. To the connection piece 23 there is attached a sleeve shaped holder 24 for the vessel 17, which for example is a glass tube sealed by a rubber stopper, in which the dry substance 25 is stored, said holder 24 extending into the first bag 10. A cannula 26 is attached at the top portion of the holder 24, said cannula communicates with the second bag 22 through the connection piece 23. A further cannula 27 intended as a venting means is attached to the holder

24 and is arranged to communicate with the exterior volume of the first bag 10.

The bag 22 has like the first bag 10 an opening with a foldable flap 31 which can be adhered against an adhesive portion 32 and by that seal the bag 22. A two way valve 28 is connected to the connection piece 23 and has a connecting member 29 facing the exterior of the bag 22 in the form of a luer coupling and a connecting member 30 in the form of a luer lock coupling extending through the wall of the bag 22.

An injection syringe 34 containing the amount of solvent needed for dissolving in the vessel 17 is inserted into the bag 22 and connected to the luer-coupling 29 of the valve 28, after which the vessel 17 is inserted into the holder 24, so that the cannulas 26 and 27 penetrate the rubber stopper 18. Solvent can now be injected into the vessel 17 (fig. 3) and this is vented through the cannula 27 to the closed space formed by the bag 10. The dissolved substance can now be sucked into the syringe 34, at which air is sucked back into the vessel through the cannula 27.

A luer-coupling 33, connected to a vein catheter, infusion bag or the like is then connected to the connecting member 30 of the valve 28, after which the valve 28 is switched over so that the liquid containing the dissolved substance can be injected through the connecting member 30 to the patient in a closed system. After the injection is finished the parts 30 and 33 are disconnected and sealed in an appropriate way, after which the bags 10 and 22 with their content are disposed.

The invention is of course not limited to the shown embodiments but a plurality of modifications are possible within the scope of the claims.

#### Claims

1. A device for transferring a substance from a vessel (17) by means of a transfer member provided with an axial passage, e.g. a tube (14) or a cannula (26), one end of which is connected or connectable to an opening of the vessel,

**characterized in,**

that it comprises two sealable plastic bags (10,22), one of which (10) is intended to enclose the vessel (17) and said one end of the transfer member (14,26,23) and the second bag (20,22) is intended to enclose the opposite end of the transfer member (14,26,23) and thereby providing a closed system for transferring the substance from the vessel (17) to the transfer member (14,26,23).

2. A device for transferring a substance from a vessel (17) by means of a transfer member provided with an axial passage, e.g. a tube (14), one end of which is connected or connectable to an opening of the vessel,

**characterized in,**

that said tube (14) extends into a sealable bag (10) of a diffusion-tight, flexible material, in

which said vessel (17) is intended to be received and enclosed, that the end of the tube which is located in said bag (10) is provided with a piston (15) having an axial through-channel (16) and that the piston (15) is slidably accommodated in said vessel (17), which has a cylindric shape.

3. A device according to claim 2,

**characterized in,**

that said tube (14) consists of a pipette intended for the determination of the blood sedimentation rate.

4. A device according to claim 2,

**characterized in,**

that to said opposite end of the tube (14) there is connected a valve (21).

5. A device according to claim 3 or 4,

**characterized in,**

that the opposite end of the tube (14) extends into and is enclosed by a second plastic bag (20).

6. A device according to claim 1,

**characterized in,**

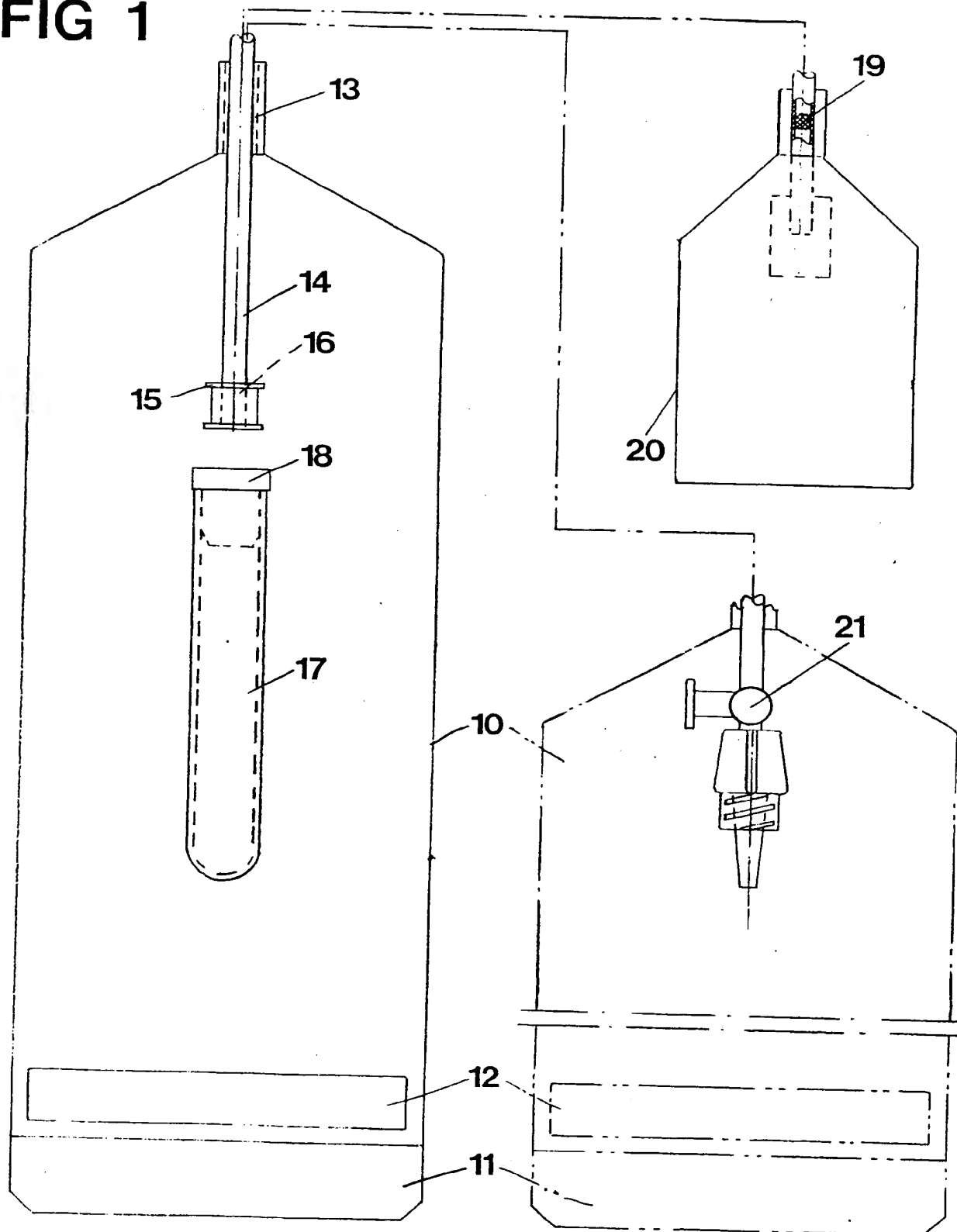
that said transfer member comprises a cannula (26) attached to a connection piece (23) extending into said second bag (22) and that the end of the connection piece (23) which is located in the second bag (22) is provided with coupling means (29) for connection of a second vessel, e.g. an injection syringe (34), received in the second bag.

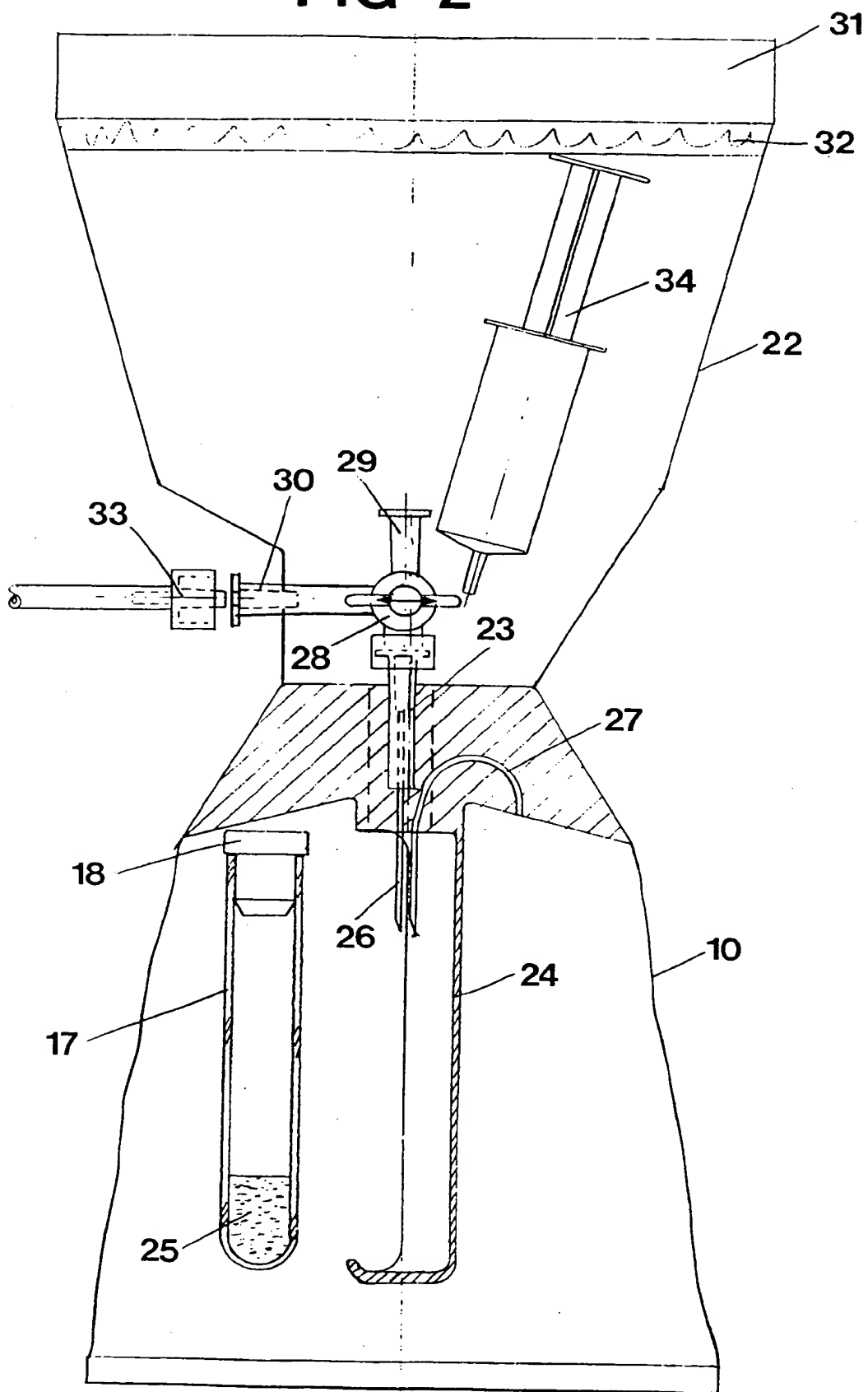
7. A device to claim 6,

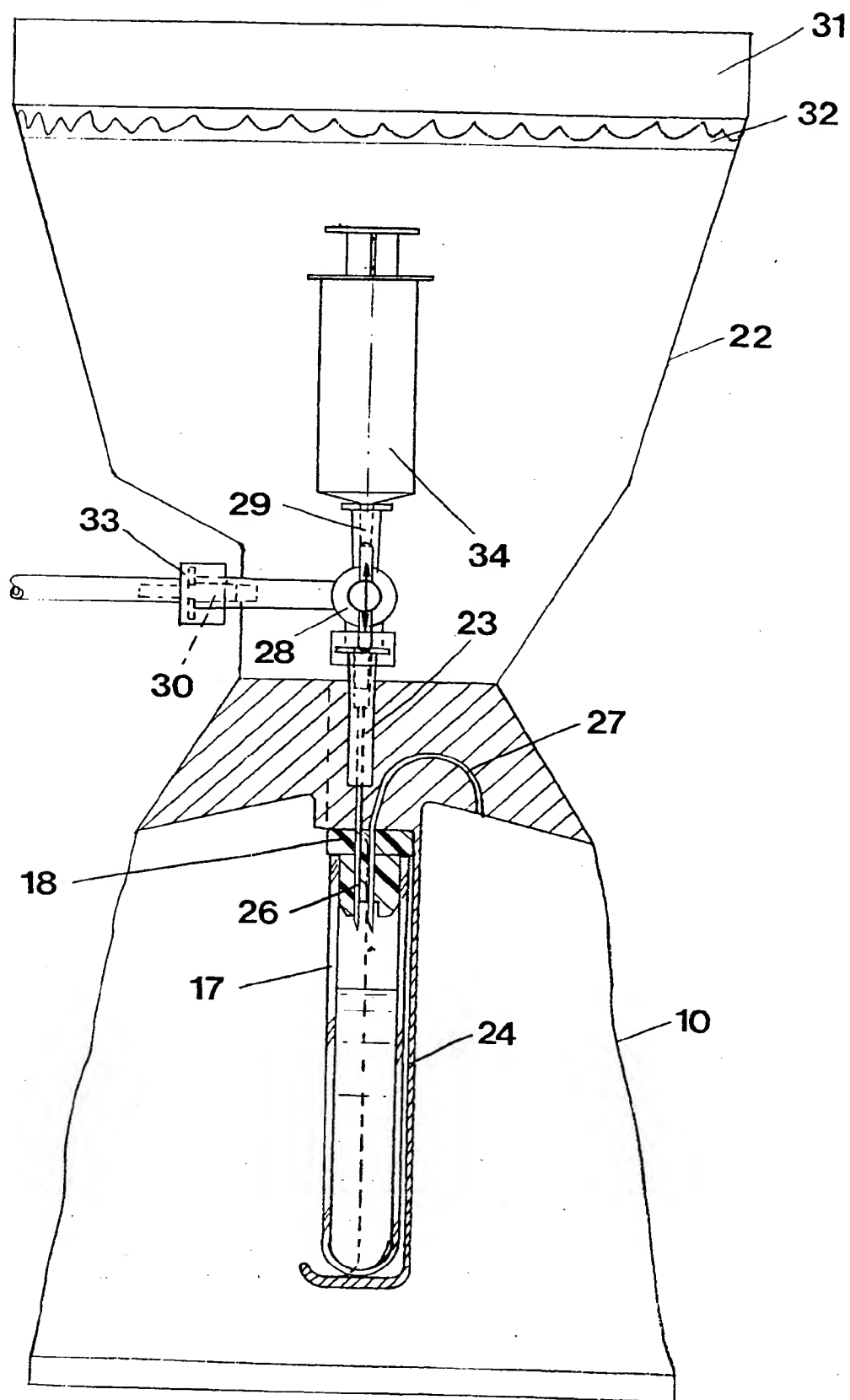
**characterized in,**

that said coupling means (29) consists of one connection of a multiple-way valve (28), which is provided with a second connection (30) located outside the second bag (22).

FIG 1



**FIG 2**

**FIG 3**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application number

| DOCUMENTS CONSIDERED TO BE RELEVANT   |  |  | EP 86850432.5  |
|---|--|--|--|
| Category  | Citation of document with indication, where appropriate, of relevant passages    | Relevant to claim                              | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)                               |
| A   | DE - A - 2 147 824 (HAMPEL HEINZ)<br>* Fig. *<br>--                              | 1  | G 01 N 33/483<br>A 61 M 5/00<br>G 01 N 33/49                                 |
| A   | US - A - 3 908 654 (LHOEST et al.)<br>* Totality *<br>--                         | 1  |  |
| A   | GB - A - 1 241 571 (DAVID SLOME)<br>* Totality *<br>--                           | 1  |  |
| A   | DE - A1 - 3 217 450 (SCHI-WA<br>ARZNEIMITTELFABRIK GMBH)<br>* Totality *<br>---- | 1  |  |
| The present search report has been drawn up for all claims  |  |  | TECHNICAL FIELDS<br>SEARCHED (Int. Cl. 4)<br><br>G 01 N 33/00<br>A 61 M 5/00 |
| Place of search<br>VIENNA   |  | Date of completion of the search<br>27-02-1987 | Examiner<br>SCHNASS  |
| <b>CATEGORY OF CITED DOCUMENTS</b><br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>A : member of the same patent family, corresponding document |  |  |  |

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